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(21)Application number : 2001-043919 (71)Applicant : NIPPON HOSO KYOKAI <NHK>

(22)Date of filing : 20.02.2001 (72)Inventor : YAMAMOTO MASAO
OYAMADA KIMIYUKI

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(54) COMMUNICATION CONTROL SYSTEM, RECEIVER AND TRANSMITTER

(57)Abstract:

PROBLEM TO BE SOLVED: To effectively utilize a network band by performing an error repair adaptive to a user request.

SOLUTION: The receiver 100 detects a packet loss of received data, specifies a browsing position of data including a missing part that is missing due to the packet loss on a window, browses data including the missing part and whose browsing position is specified on the window, selects only a desired repair part. The transmitter 200 generates repair data corresponding to the recovered part on the basis of selection information denoting the selected recovered part and the receiver 100 repairs only the desired repair part among data subjected to packet loss on the basis of the generated

recovery data and reproduces the resulting data.

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2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] With a data transmitting means to exchange data through a network between a sending set and a receiving set and to be a communications control method and to transmit the data of a packet unit to a receiving set from a sending set, and said receiving set A packet loss detection means to detect said packet loss of data which received, A specific means to pinpoint the notice location on a window about data including the lack part which was missing with said packet loss, A notice means to put up on a window data including the lack part where said notice location was pinpointed, Out of said put-up data with a selection means to choose only a desired restoration part, a resending demand means to transmit the selection information which shows said selected restoration part to said sending set, and said sending set Based on said transmitted selection information, with a data origination means for restoration to create the data for restoration corresponding to a restoration part, a resending

means to resend said created data for restoration to said receiving set, and said receiving set The communications control method characterized by having a restoration means to restore only a desired restoration part among said data which carried out the packet loss, based on said resent data for restoration.

[Claim 2] About the data to show, said receiving set does not restore once data including the lack part which carried out the packet loss at the time of reception of an eye, but presents them on a window as it is. Once a notice of an eye is completed [this], the lack part where data were missing with a packet loss is shown on a window. Choose only the restoration part which a user wants to restore from the put-up this lack parts, and a resending demand is carried out at said sending set. The communications control method according to claim 1 characterized by receiving said data for restoration resent from said sending set, and restoring the lack part at the time of playback of an eye once using the this resent data for restoration.

[Claim 3] Said detection means is a communications control method according to claim 1 or 2 characterized by detecting a packet loss using the sequence number which uses RTP (Real-time Transport Protocol) specified by RFC (Request For Comments)1889 of IETF (Internet Engineering Task Force) as a

transfer protocol, and is described by the packet header.

[Claim 4] The communications control method according to claim 1 to 3 characterized by preparing the extended header for storing the information which pinpoints the presentation location on the window of coded data by the receiving side in the payload field of the packet of said RTP, and transmitting the packet of this RTP to said receiving set.

[Claim 5] Said resending means is a communications control method according to claim 1 to 4 characterized by using TCP (Transmission Control Protocol) as a transport layer protocol, and transmitting said data for restoration to said receiving set.

[Claim 6] The receiving set characterized by being the receiving set which communicates data through a network between sending sets, having been used for the communications control method according to claim 1 to 5, and having said packet loss detection means in this communications control method, said specific means, said notice means, said selection means, said resending demand means, and said restoration means.

[Claim 7] The sending set characterized by being the sending set which communicates data through a network between receiving sets, having been

used for the communications control method according to claim 1 to 5, and having said data transmitting means in this communications control method, said data origination means for restoration, and said resending means.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the data telecommunication system using a computer network, and relates to the communications control method which can perform receiving quality control which was adapted for the user demand especially, a receiving set, and a sending set.

[0002]

[Description of the Prior Art] Use of the application which transmits streaming media on a network is spreading with broadband-izing of the Internet in recent years or intranet (henceforth a network by considering these as a generic name).

[0003] In the transfer of streaming media, it is required to reproduce faithfully the playback timing which the data transmitted have from the first by the receiving side, and RTP (Real-time Transport Protocol) is widely used as a transfer protocol for realizing this.

[0004] Hereafter, the main descriptions of RTP are described.

[0005] The field which describes a time stump and a sequence number is included in the packet header, and RTP is equipped with the function which supervises the quality of data transfer using such information.

[0006] However, the framework of the protocol about quality control of received data like resending control is not specified, but must mount the error control approach according to the requirements according to individuals, such as delay and extent of receiving quality, for every application. Various kinds of coded data are held in the payload field of a RTP packet in the format specified for every method. As an RFC number as which the typical coding method was specified, RFC2250 (MPEG 1/2), RFC2343 (MPEG-2 A/Vbundled), and RFC2354 (MotionJPEG) are mentioned.

[0007] Drawing 10 shows the example of the protocol stack in the case of distributing streaming media using RTP.

[0008] RTP is a protocol mounted in a user area. It is common to use UDP (User Datagram Protocol) suitable for distribution of real time nature data as a transport layer protocol (this configuration is hereafter called RTP/UDP).

[0009] Although current and much applications have distributed streaming media with the configuration of RTP/UDP, since UDP characterized by non-trusting transmission (unreliable transmission) is used, degradation of the receiving quality resulting from a packet loss may take place.

[0010] As the technique of restoring degradation of this receiving quality,

following three are mentioned to RFC2354 (Options for Repair of Streaming Media).

** redundancy -- ****** -- the technique of raising a receiving probability by transmitting the already transmitted copy of data, or transmitting the already transmitted copy of data using a different coding method to different timing by timing.

** The technique of being a resending receiving side, and requiring retransmission of message of these data from a transmitting side, when a packet loss and an error are detected.

** Forward error correction (FEC)

An error correcting code is added, it transmits and an error is corrected by the receiving side.

[0011] Application of streaming is mounted according to an individual combining one or ** of the restoration technique of the above-mentioned ** - ** - **.

[0012]

[Problem(s) to be Solved by the Invention] Only resending of ** can offer reliance transmission (reliable transmisson) which can recover an error completely among the restoration means of the above-mentioned ** - **. The technique

using TCP (Transmission Control Protocol) specified by RFC793 as an example of implementation of the resending technique is typical.

[0013] The ACK signal which shows that the receiving set 100 of drawing 10 received data normally is transmitted to a sending set 200, and when ACK is not received in the time amount on which the sending set 200 decided beforehand, resending processing of the data concerned starts as that in which data did not reach a receiving set 100 normally. Since a sending set 200 can transmit data continuously when the network is not crowded, in a receiving set 100, data are receivable by the high response and low delay.

[0014] The case where the network was crowded and a packet loss occurs becomes a problem. ACK is not sent to a sending set 200 by the packet loss, but resending processing is started. A throughput falls at this time and delay occurs in reception of the data in a receiving set 100.

[0015] When reception of ACK is long overdue in a sending set 200 as another problem, although data are normally received by the receiving set 100, it is the case where these data are resent, and a network band will be wasted.

[0016] Thus, since there are a problem of delay and a problem of waste of a network band in resending, the resending technique is not suitable as a means

to restore degradation of the receiving quality in the application of streaming with which a high response is demanded.

[0017] FEC is effective as RFC2354 has description on the other hand as a means of the error restoration for reproducing streaming media to a high response and low delay.

[0018] However, there being a limit in extent of an error restorable by FEC, and restoring degradation 100% like a resending means cannot be guaranteed theoretically, and it cannot meet the demand of wanting to restore degradation certainly.

[0019] Then, the purpose of this invention is to offer the communications control method which error restoration which was adapted for the user demand is performed, and can aim at a deployment of a network band, a receiving set, and a sending set.

[0020]

[Means for Solving the Problem] This invention with a data transmitting means to be the communications control method which communicates data through a network, and to transmit the data of a packet unit to a receiving set from a sending set between a sending set and a receiving set, and said receiving set A

packet loss detection means to detect said packet loss of data which received, A specific means to pinpoint the notice location on a window about data including the lack part which was missing with said packet loss, A notice means to put up on a window data including the lack part where said notice location was pinpointed, Out of said put-up data with a selection means to choose only a desired restoration part, a resending demand means to transmit the selection information which shows said selected restoration part to said sending set, and said sending set Based on said transmitted selection information, with a data origination means for restoration to create the data for restoration corresponding to a restoration part, a resending means to resend said created data for restoration to said receiving set, and said receiving set A communications control method is constituted by having a restoration means to restore only a desired restoration part among said data which carried out the packet loss, based on said resent data for restoration.

[0021] About the data to show, said receiving set does not restore once data including the lack part which carried out the packet loss at the time of reception of an eye, but presents them on a window as it is here. Once a notice of an eye is completed [this], the lack part where data were missing with a packet loss is

shown on a window. Only the restoration part which a user wants to restore is chosen from the put-up this lack parts, said data for restoration which carried out the resending demand and were resent to said sending set from said sending set are received, and you may make it restore the lack part at the time of playback of an eye once using the this resent data for restoration.

[0022] As said detection means, RTP (Real-time Transport Protocol) specified by RFC (Request For Comments)1889 of IETF (Internet EngineeringTask Force) may be used as a transfer protocol, and a packet loss may be detected using the sequence number described by the packet header.

[0023] The extended header for storing the information which pinpoints the presentation location on the window of coded data by the receiving side may be prepared in the payload field of the packet of said RTP, and the packet of this RTP may be transmitted to said receiving set.

[0024] TCP (Transmission Control Protocol) may be used for said resending means as a transport layer protocol, and it may transmit said data for restoration to said receiving set.

[0025] This invention constitutes a receiving set by having said packet loss detection means to be the receiving set which communicates data through a

network, to be used for said communications control method, and to constitute this communications control method between sending sets, said specific means, said notice means, said selection means, said resending demand means, and said restoration means.

[0026] This invention constitutes a sending set by being the sending set which communicates data through a network between receiving sets, being used for said communications control method, and having said data transmitting means to constitute this communications control method, said data origination means for restoration, and said resending means.

[0027]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail with reference to a drawing.

[0028] (Outline) The outline of this invention is explained first.

[0029] If a packet loss occurs on a network when receiving the streaming media (program playback on the real time on the Internet) represented by the animation through a network generally, the data shown to a user will be partially missing.

[0030] This invention carries out the visualization of the lack part which can be resent, shows it to a user, chooses only the part which a user wants to restore,

and can be made to carry out a resending demand by matching a packet loss and the lack part of the data on a window (display screen).

[0031] That is, in the communication system using a network, this invention does not apply once the resending means for restoring the data which carried out the packet loss at the time of reception of an eye, but it uses positively the real time nature of the data transfer which UDP has, admitting degradation of the presentation information by the packet loss. It resends using TCP about the part which presented on the window the part where data were missing with a packet loss, was made to choose only the part which a user wants to restore for the purpose of a deployment of a network band, and was chosen once playback of an eye was completed [this], and is characterized by restoring a selection part with the resent data.

[0032] If it puts in another way, as for this invention, a receiving set the packet loss on a network Detect from the discontinuity part of the sequence number of a RTP header, and the presentation location on the window of the coded data which was missing with a packet loss is pinpointed. A resending demand is performed to a sending set about the part which presented the pinpointed part on the window, was made to choose only a part to restore to a user, and was

made to choose, and it is characterized by restoring and putting up only a part restoring using the data for restoration resent from the sending set.

[0033] (Example) A concrete example is given and explained hereafter.

[0034] As effective application of the communication system by this invention, there is video edit (voice is also included) using a network.

[0035] <System configuration> This structure of a system is first explained based on drawing 1 - drawing 3 .

[0036] (Communication system) Drawing 3 shows the concept of communication system applicable to the telecommunications control system concerning this invention.

[0037] This system is constituted through a network 1 by the sending set 200 which consists of a receiving set 100 which consists of edit terminals, such as a network computer, and data 201 and servers 202, such as a hard disk.

[0038] (Receiving set) Drawing 1 shows the configuration of a receiving set 100.

[0039] A receiving set 100 consists of the user input interface section 101, the network interface section 102, an OS (Operating System) section 110, the RTP (Real-time Transport Protocol) processing section 120, and the application process section 130.

[0040] It connects with the input devices 300, such as a mouse and a keyboard, and the user input interface section 101 transmits the signal sent to the user input interface section 101 through the input device 300 from the user to the OS section 110.

[0041] It connects with a network 1, and the network interface section 102 transmits the resending demand signal A transmitted from the OS section 110 to a network 1 while transmitting the data transmitted through the network 1 to the OS section 110.

[0042] (OS section) The OS section 110 consists of the user input processing section 111, the IP (Internet Protocol) processing section 112, and the UDP (User Datagram Protocol) processing section 113 and the TCP (Transmission Control Protocol) processing section 114.

[0043] In the user input processing section 111, the signal transmitted from the user input interface section 101 is transmitted to the application process section 130.

[0044] After IP processing section 112 performs protocol processing to which the data transmitted from the UDP processing section 113 are specified by RFC while it performs protocol processing specified by RFC (Request For Comments)

and transmits it to the UDP processing section 113, it is transmitted to the network interface section 102.

[0045] The UDP processing section 113 performs protocol processing specified by RFC768, and transmits it to the RTP processing section 120.

[0046] The TCP processing section 114 is used as a transport layer protocol for the resending demand from the application process section 130.

[0047] After the TCP processing section 114 performs protocol processing to which the resending requested data transmitted from the resending demand processing section 134 of the application process section 130 is specified by reception and RFC, it is transmitted to IP processing section 112. Moreover, it is resent from a sending set 200, and after performing protocol processing to which the resending data transmitted through IP processing section 112 are specified by reception and RFC, it transmits to the application process section 130.

[0048] (RTP processing section) The RTP processing section 120 consists of a packet loss detecting element 121 and the presentation location specification section 122. In addition, since the processing section which performs protocol processing specified to RFC about RTP is not related to actuation of this invention, the explanation is omitted.

[0049] (Application process section) The application process section 130 is constituted by the decode section 131, the image reproduction section 132, the lack part presentation section 133, the resending demand processing section 134, and the restoration processing section 135. This application process section 130 is connected with the external monitor 90 in order to display an image.

[0050] (Sending set) Drawing 2 shows the configuration of a sending set 200.

[0051] A sending set 200 consists of the network interface section 201, an OS section 210, the RTP processing section 220, and the application process section 230.

[0052] In addition, since it has the same function as a receiving set 100 about the network interface section 201 and the OS section 210, explanation here is omitted.

[0053] (RTP processing section) As shown in drawing 6 mentioned later, the RTP processing section 220 enters the address information 500 which shows the presentation location on a window in the extended header 403 which was newly able to be prepared in the RTP packet 400, while performing regular protocol processing. About this address information 500, it is notified from the

presentation location address adjunct 231 of the application process section 230 at the time of data transfer.

[0054] (Application process section) The application process section 230 is constituted by presentation location address pricing Kabe 231 and the resending processing section 232.

[0055] The presentation location address adjunct 231 pinpoints the presentation location on a window, and notifies it to the RTP processing section 220.

[0056] As the specific approach of a presentation location, it decodes, before transmitting are recording data, and the display position of the data is checked beforehand, and the approach of performing relating with a presentation location when coded data and its coded data are decoded can be applied.

[0057] For example, in the presentation location address adjunct 231, the address information 500 which shows the presentation location on a window is created, and the address information 500 for pinpointing this presentation location is notified to the RTP processing section 220. In the RTP processing section 220, this adds address information 500 to the extended header 403 newly prepared in the RTP packet 400 which consists of a header unit 401 and the payload section 402, as shown in drawing 6 .

[0058] The resending processing section 232 specifies the data which should be resent from the address information 500 which shows the time code and presentation location of the frame in which the data for resending received from the receiving set 100 are contained, and transmits these data to a receiving set 100 through the OS section 210.

[0059] <System behavior>, next actuation of this system are explained based on drawing 4 - drawing 9 .

[0060] (Sending set side) In a sending set 200, regular protocol processing is performed in the RTP processing section 220, and the data constituted as a RTP packet 400 of a packet unit are transmitted to a receiving set 100.

[0061] (Receiving-set side: Packet loss detection processing) Drawing 4 is a flow chart which shows processing by the packet loss detecting element 121.

[0062] First, the RTP processing section 120 waits for reception of the RTP packet 400 in a standby condition (step S1).

[0063] Next, a sequence number is taken out from the header unit 401 of the RTP packet 400 (step S2).

[0064] Whenever one RTP packet 400 is transmitted, the increment of this sequence number is carried out every [1], as specified to RFC1889. And the

taken-out sequence number is set to Nnew (step S3).

[0065] Next, sequence number Nold of the RTP packet 400 which received the taken-out sequence number Nnew and before 1 packet is compared (step S4).

[0066] When the difference is 1 as a result of a comparison, lack of a packet judges it as what is not, and Nold is updated to Nnew (step S5), and it stands by until the following RTP packet 400 arrives (step S1).

[0067] On the other hand, when the difference does not exist 1 as a result of a comparison, it is judged as what lacked the packet and presentation location specification processing (step S6) shown in drawing 5 mentioned later is performed. Moreover, it can come, simultaneously Nold is updated to Nnew, and it stands by until the following RTP packet 400 arrives (step S1).

[0068] In addition, since a sequence number is expressed by 16 bits (0-65535), when a sequence number changes to 0 from 65535, it must add exception handling at the time of count of Nnew-Nold. Moreover, in the packet loss detecting element 121, the address value Aold which shows the presentation location on the window later mentioned besides Nold is accumulated.

[0069] (Receiving-set side: Presentation location specification processing) Drawing 5 is a flow chart which shows processing in the presentation location

specification section 122.

[0070] In the packet loss detecting element 121, after detecting a packet loss, the processing for presentation location specification is started.

[0071] First, it waits for the notice from the packet loss detecting element 121 in a standby condition (step S11).

[0072] Three parameters with the number Anum of the address over the plurality currently described at the address value Anew which shows the presentation location currently described at the address value Aold which shows the presentation location currently described from the packet loss detecting element 121 at the RTP packet in front of [of the missing RTP packet] one, and a new RTP packet, and a new RTP packet are received (step S12).

[0073] From the above three parameters (Aold, Anew, Anum), it specifies that a missing presentation location is the range of Aold+1 - Anew+Anum -1 (step S13).

[0074] At the end, the specified result is notified to the application process section 130, processing is ended (step S14), and it returns to a standby condition (step S11).

[0075] In addition, when the data equivalent to one presentation location are divided and transmitted to two or more RTP packets 400, the address

information 500 which shows the same presentation location is added to the extended header 403 of two or more corresponding RTP. When at least one of two or more continuous RTP packets 400 to which the address value which shows this same presentation location was added carries out a packet loss, according to specific processing of drawing 5 , this presentation location address is specified as a lack part, and is notified to the application process section 130.

[0076] (Receiving-set side: Application process) In the application process section 130, the coded data transmitted from the RTP processing section 120 is decoded in the decode section 131. In addition, to use the data of the frame of order among coding methods in the case of decode (for example, three kinds, I (Intra-frame) picture, P (Prediction) picture, and B (Bi-directional) picture, are intermingled, and it is transmitted, among these P picture decodes a front frame and B picture in MPEG-2 using the data of the frame of order), in the decode section 131, it is necessary to perform the following processings.

[0077] That is, in case a certain part is decoded, when the data of a frame before and after needing are lost by the packet loss, the part concerned cannot be decoded normally. In this case, although it was required to decode the information which shows the location of the part concerned, and the part

concerned, the information for pinpointing the part which has carried out the packet loss is notified to the lack part presentation section 133 as decode impossible part information.

[0078] In the image reproduction section 132, the data decoded in the decode section 131 are stored in buffer memory, D/A conversion of the stored data is carried out one by one, and it outputs to a monitor. Moreover, output processing to a monitor is performed also about the image created in the lack part presentation section 133.

[0079] In the lack part presentation section 133, based on the presentation positional information notified from the presentation location specification section 122 of the RTP processing section 120, the image which shows a lack part is created by HTML (HyperText Markup Language) and markup languages, such as XML (eXtensible Markup Language), and is transmitted to the image reproduction section 132.

[0080] Drawing 9 shows the example of a configuration of the image (one frame) 600 created.

[0081] If the part where the x section 601 in drawing was missing with a packet loss is shown and a user clicks the x section 601, the image is created by the

markup language so that a resending demand part (presentation address) may be notified to the resending demand processing section 134.

[0082] In addition, when decode impossible part information is notified from the decode section 131, x similarly showed the decode impossible part, correlation with the part which has carried out the packet loss is performed although it was required for decode and a decode impossible part is clicked, although it was required to decode it, the resending demand of a part which has carried out the packet loss is performed.

[0083] In the resending demand processing section 134, if a resending demand part is notified from the lack part presentation section 133, a resending demand packet including the information which can pinpoint the resending demand part concerned in a sending set 200 side will be transmitted to a sending set 200. The information which can be transmitted combining the address value which shows the time code and presentation location of the frame in which the resending demand part concerned is included as information which can pinpoint the resending demand part concerned with a sending set 200 can be used.

[0084] (Sending-set side: Address attached processing) In a sending set 200, the data which should be resent from the address information which shows the

time code and presentation location of the frame in which the data for resending received from the receiving set 100 are contained are specified in the resending processing section 232.

[0085] In the RTP processing section 220, while performing regular protocol processing, the address information 500 which shows the presentation location on the window mentioned above is stored in the extended header 403 which was newly able to be prepared in the RTP packet 400.

[0086] Attached processing to the extended header 403 of address information 500 is performed by presentation location address pricing Kabe 231.

[0087] Drawing 7 and drawing 8 show the relation between the presentation location 710 on a window 700, and the address value 720.

[0088] Since the lack range of the screen resulting from a packet loss differs for every coding method, it should just determine the relation between the presentation location 710 on a window 700, and the address value 720 based on the influencing range of effect on the screen of a packet loss.

[0089] Drawing 7 shows the relation between the presentation location 710 on the window 700 in case the influencing range of the effect of [when 1RTP packet loses] is restricted in each block, and the address value 720.

[0090] Drawing 8 shows the relation between the presentation location 710 on the window 700 in case the effect of [when 1RTP packet loses] amounts to one frame, and the address value 720. The whole window is pointed out in the presentation location 710 in the case of drawing 8 . As an address value at this time, the time record value which a dynamic image increments every [per frame / 1] is used. In addition, this example explains the case where drawing 7 is applied.

[0091] In a sending set 200, when the data on the payload section 402 straddle two or more presentation locations as an address value which shows a presentation location to the newly prepared extended header 403, the address value (in Aold and Anew which were mentioned above) of the number (in Anum mentioned above) of the address which straddled, and the last is described.

[0092] For example, when the data on the payload section 402 are equivalent to the location over "1" to "3" of drawing 7 , "3" is described in the extended header 403 as an address value which shows a presentation location for "3" as the number of the address which straddled.

[0093] On the other hand, it is Bundled. By RFC2343 which specified the payload format of MPEG, it recommends holding data on the payload section

402 of the RTP packet 400 in the unit which does not cause fragmentation by the lower layer, and if it chooses as a unit which holds 1 macro block (it is usually 16 pixel x16 pixel at the unit of the data which perform a motion compensation) in a payload, when the most, it will be described that the fragmentation in a lower layer does not happen.

[0094] When the payload length of RTP is set as the die length to which fragmentation does not happen by the lower layer according to this recommendation, the data which the data length equivalent to one presentation location may exceed the payload length of RTP, and are equivalent to one presentation location are held and transmitted ranging over the payload of two or more RTP packets 400. in this case, the extended header 403 of two or more of these RTP packets 400 -- the same presentation location address information 500 is added to all.

[0095] Thus, the data constituted by the RTP packet 400 to which address information 500 was added are sent to a receiving set 100 through the OS section 210.

[0096] (Receiving-set side: Restoration processing) In a receiving set 100, in the restoration processing section 135, the data 400 resent from the sending set 200,

i.e., the RTP packet to which address information 500 was added, are received through the OS section 110, and the image data with which the lack part was restored combining these data and the data once received to the eye are transmitted to the image reproduction section 132. Thereby, the restored image data which are considered as a request of a user are reproduced.

[0097] As explained above, this communication system at the time of playback of the once eye of an image A reproductive continuity is secured without the resending processing with a possibility of generating delay carrying out. Since there is an advantage which can resend alternatively only the part which a program editor needs to restore and check once finishing playback of an eye, it is related with the video edit using a network 1. Especially since it is thought as important that it is continuously reproducible without a high response and a series of high images rather equivalent to VTR especially breaking off rather than the height of the playback image quality under edit at a broadcasting station, or freezing, it is effective.

[0098] Moreover, this communication system is applicable also to streaming service of a mold on demand, static-image distribution service, and text distribution service.

[0099]

[Effect of the Invention] As explained above, according to this invention, the packet loss of data which received is detected. The notice location on a window is pinpointed about data including the lack part which was missing with a packet loss. Put up on a window data including the lack part where the notice location was pinpointed, and only a desired restoration part is chosen. Based on the selection information which shows the selected restoration part, create the data for restoration corresponding to a restoration part, and since only a desired restoration part is restored among the data which carried out the packet loss based on the created data for restoration and it was made to reproduce At the time of reception of an eye, the resending means for restoring the data which carried out the packet loss is not applied once. The real time nature of the data transfer which UDP has can be used positively, admitting degradation of the presentation information by the packet loss, only a part to restore can be chosen, and quality can be recovered certainly. By this The error restoration which was adapted for the user demand is attained, and a deployment of a network band can be aimed at.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram which is the gestalt of operation of this invention and in which showing the configuration of a receiving set.

[Drawing 2] It is the block diagram which is the gestalt of operation of this

invention and in which showing the configuration of a sending set.

[Drawing 3] It is the block diagram showing the system configuration in the case of performing program edit using a network.

[Drawing 4] It is the flow chart which shows packet processing detection processing.

[Drawing 5] It is the flow chart which shows the processing in the presentation location specification section.

[Drawing 6] It is the explanatory view showing the extended header which stores the address to show a presentation location.

[Drawing 7] It is the explanatory view showing the configuration in the case of setting up two or more presentation location addresses on one window.

[Drawing 8] It is the explanatory view showing the configuration in the case of setting up the one presentation location address on one window.

[Drawing 9] It is the explanatory view showing the example of the image created in the lack part presentation section.

[Drawing 10] It is the explanatory view showing one example of the protocol stack in the case of carrying out data distribution using RTP in the former.

[Description of Notations]

1 Network

100 Receiving Set

101 User Interface Section

102 Network Interface Section

110 The OS Section

120 RTP Processing Section

130 Application Process Section

200 Sending Set

201 Network Interface Section

210 The OS Section

220 RTP Processing Section

230 Application Process Section

400 RTP Packet

401 Header Unit

402 Payload Section

403 Extended Header

500 Address Information

700 Window

710 Presentation Location

720 Address Value